

### REMARKS

Applicant has amended claims 1, 3, 5, and 7 to more particularly point out and distinctly claim the subject matter which Applicant regards as his invention. Support for the amendments can be found at page 7, lines 19-22 of the Specification. Applicant has also replaced original Figs 1 and 2 with enlarged figures. No new matter has been introduced.

Claims 1-8 are currently pending. Reconsideration of the application, as amended, is respectfully requested in view of the remarks below.

The Examiner rejected claims 1-8 under 35 U.S.C. § 103(a) as being obvious over Japanese Patent 2742948 ("the '948 patent") or Japanese Patent 7-242935 ("the '935 patent"). See the Office Action, page 2, lines 15-17. Applicant respectfully traverses below.

Claims 1, 3, 5, and 7 are independent and will be discussed first. Claims 1 and 3 are drawn to martensitic stainless steel compositions. Each of them, as amended, recites a steel composition in which the content of Cr<sub>23</sub>C<sub>6</sub> is minimized. Claims 5 and 7 are drawn to methods of manufacturing the claimed martensitic stainless steel. Similar to amended claims 1 and 3, each of amended claims 5 and 7 recites a steel composition in which the content of Cr<sub>23</sub>C<sub>6</sub> is minimized. According to this invention, "the N content is additionally added to reduce the L-ferrite and to stabilize austenite. In addition, the large amount of N delays the transition of the steel to a large carbide such as [Cr<sub>23</sub>C<sub>6</sub>] so as to prevent the deterioration of the corrosion resistance caused by the exhausting of Cr". See the Specification, page 7, lines 17-22. In other words, the content of Cr<sub>23</sub>C<sub>6</sub> is minimized in the steel compositions of this invention due to the introduction of a large amount of N, i.e., 0.11-0.25 wt%. See, e.g., claim 1.

Applicant will discuss the '948 patent first. The Examiner pointed out that this patent discloses a martensitic steel "with constituents whose wt% ranges overlap those recited by the claims." See the Office Action, page 2, lines 18-19. The '948 patent discloses a steel composition containing 0.03-0.15 wt% N. However, it does not disclose or suggest that the content of Cr<sub>23</sub>C<sub>6</sub> is minimized in a steel composition as required by amended claims 1, 3, 5, and 7. The content of Cr<sub>23</sub>C<sub>6</sub> is minimized by introducing a large amount of N (i.e., 0.11-0.25 wt%) into a steel composition of this invention.

As pointed out by the Examiner, the '948 patent discloses "examples 9, 23, 24, and 26 which meet the claimed composition except contain slightly lower amounts of Nitrogen." See the Office Action, page 2, lines 22-23. To the extent that all of the preferred embodiments presented in the '948 patent disclose steel compositions containing less than 0.11 wt% N, the '948 patent teaches away from amended claims 1, 3, 5, and 7, each of which requires that a steel composition contains 0.11-0.25 wt% N. As discussed above, introduction of a large amount of N is required to minimize the content of  $\text{Cr}_{23}\text{C}_6$  in a steel composition of this invention.

Thus, for the reasons set forth above, claims 1, 3, 5, and 7 are not rendered obvious by the '948 patent.

Applicant now turn to the '935 patent. The Examiner pointed out that this patent discloses a martensitic steel "with constituents whose wt% ranges overlap those recited by the claims." See the Office Action, page 2, lines 18-19. Indeed, the '935 patent broadly discloses a steel composition containing 0.01-0.25 wt% N, which encompasses the N content recited in amended claims 1, 3, 5, and 7. However, the '935 patent does not disclose or suggest that the content of  $\text{Cr}_{23}\text{C}_6$  is minimized in a steel composition as required by amended claims 1, 3, 5, and 7. Thus, claims 1, 3, 5, and 7 are not rendered obvious by the '935 patent

As discussed above, introduction of a large amount of N (i.e., 0.11-0.25 wt% N) is required in order to minimize the formation of a large carbide (e.g.,  $\text{Cr}_{23}\text{C}_6$ ) and to improve corrosion resistance. According to the Manual of Patent Examining Procedure § 2131.03, "[i]f the claims directed to a narrow range, the reference teaches a broad range, and there is evidence of unexpected results within the claimed narrow range ... it may be reasonable to conclude that the narrow range is not disclosed with 'sufficient specificity' to constitute an anticipation of the claims. The unexpected results may also render the claims unobvious." Here, as discussed above, the composition recited in each of amended claims 1, 3, 5, and 7 contains a narrow range (0.11-0.25 wt.% N), while the composition disclosed in the '935 patent contains a broad range (0.01-0.25 wt.% N). There is evidence of an unexpected result within a narrow range: the content of a large carbide (e.g.,  $\text{Cr}_{23}\text{C}_6$ ) is unexpectedly minimized in a steel composition, resulting in improved corrosion resistance. Thus, this unexpected result also renders claims 1, 3, 5, and 7 nonobvious over the '935 patent.

The Examiner also pointed out that "the '935 patent discloses examples 215, 226, 244, and 273 on pages 28 to 34 which meet the claimed composition except for slightly higher amount of one element. Criticality of applicant's more narrowly claimed ranges needs to be established to define claims over prior art." See the Office Action, page 3, lines 9-12. As discussed above, the steel compositions of this invention contain 0.11-0.25 wt.% N. This N content is critical to minimize the content of  $\text{Cr}_{23}\text{C}_6$  and improve corrosion resistance. Thus, claims 1, 3, 5, and 7 are not rendered obvious by the '935 patent, which does not even suggest a steel composition in which the content of  $\text{Cr}_{23}\text{C}_6$  is minimized.

Since none of the '948 patent and the '935 patent discloses or suggests a steel composition in which the content of  $\text{Cr}_{23}\text{C}_6$  is minimized, neither does their combination. Thus, claims 1, 3, 5, and 7 are not rendered obvious by the '948 patent or the '935 patent.

Claims 2, 4, 6, and 8, dependent from claims 1, 3, 5, and 7, are also not rendered obvious by these two patents.

#### CONCLUSION

Applicant submits that the grounds for rejection asserted by the Examiner have been overcome, and that claims 1-8, as pending, define subject matter that is non-obvious. On this basis, it is submitted that all claims are now in condition for allowance, an action of which is requested.

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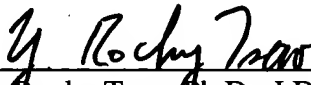
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Respectfully submitted,

Date: \_\_\_\_\_

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